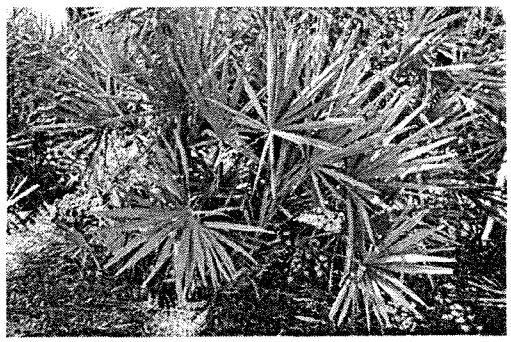
*Serenoa repens* (Bartr.) Small — saw palmetto
PALMAE

Synonyms: None



**General Description.**—Saw palmetto, also known as palmetto, is a low-growing palm endemic to the Southeastern United States. Saw palmetto stems typically lie prostrate at the soil surface but can grow upright and reach heights of 5 to 7 m (Tanner and others 1996). Multiple, persistent, palmate leaves up to 1 m wide emerge from the stem's terminal buds. Short recurved spines line the petioles (Small 1933). Flowers are perfect and borne on paniculate inflorescences that emerge from the leaf bases. The fruit is a one-seeded ellipsoid or subglobose drupe with a fleshy mesocarp, 16 to 25 mm long and 12 to 19 mm wide. Fruit color turns from green, to yellow, to orange, and then to bluish-black when fully ripe (Hilmon 1968).

**Range.**—Saw palmetto is endemic to the Coastal Plain of the Southeastern United States. The northern limits of its range extend from southeastern Louisiana through Tifton Georgia to Charleston County, South Carolina (Hilmon 1968, McNab and Edwards 1980).

**Ecology.**—Saw palmetto occurs as a major understory plant in seasonally wet pine flatwoods, well-drained scrubby flatwoods, and on sandy berms and dunes along rivers and the coast (Tanner and others 1996). Within these habitats, it can grow in a variety of conditions from shade to full sun (Small 1926). Common associates include: gallberry [*Ilex glabra* (L.) Gray], wax myrtle (*Myrica cerifera* L.), staggerbush [*Lyonia ferruginea* (Walter) Nuttall], oaks (*Quercus spp.* L.), wiregrass (*Aristida beyrichiana* Trin. & Rupr.), several bluestem species (*Andropogon spp.* L.), and lop-sided Indian grass [*Sorgastrum secundum* (Ell.) Nash.] (Tanner and others 1996). Saw palmetto occurs on a wide range of soil types but most commonly is found on seasonally flooded, sandy, acidic spodosols typical of flatwoods ecosystems in the Lower Coastal Plain. Typical soil types are Leon fine sand, Myakka fine sand, and Immokalee fine sand. Saw palmetto also grows on deep, sandy entisols, on calcareous sandy soils near coasts, and on limestone in southern Florida. Annual rainfall varies from 114 cm in the northern part of its range to over 150 cm along the southeastern coast of Florida. Rainfall also becomes more seasonal going from north to south, with increasingly more rainfall occurring during summer. In southern Florida, the southernmost part of its range, 64 percent of average annual rainfall occurs from June to September (Hilmon 1968).

**Reproduction.**—Saw palmettos primarily reproduce vegetatively through suckers from the main stem (Fisher and Tomlinson 1973). Each sucker has the capacity to become a ramet, forming extensive clumps of genetically identical clones. Saw palmettos must be at least 0.6 m in height to flower (Carrington and others 2000) after which probability of flowering increases with plant height. Inflorescences emerge from buds at the bases of previous season's leaves in February to April, and flowering occurs from April to June (Hilmon 1968). Flowers are insect pollinated (Tanner and others 1996). While 34 insect species are known to pollinate saw palmetto flowers, the European honeybee (*Apis mellifera* L.) is the primary pollinator (Carrington and others in review). Emerging saw palmetto inflorescences are subject to attack by cabbage palm caterpillars (*Litoprosopus futilis* G. & R.), and green fruits are subject to anthracnose [*Colletotrichum gloeosporioides* (Penz.) Penz. & Sacc. in Penz.] (Carrington and others 2000). Fruits ripen in August to November. Saw palmettos flower heavily about every 2 to 4 years. During these years, individual ramets commonly produce two to three inflorescences. Due to high flower density (several thousand flowers/inflorescence), typically 0.4 to 0.5 kg of fruit are produced on each inflorescence. In some cases, individual inflorescences can produce up to 12 kg of fruit. Average fruit yield for a site is approximately 200

kg/ha; however, yields can vary from less than 100 kg/ha to more than 1,500 kg/ha (Carrington and others 1997). Fruits are bird and mammal dispersed (Tanner and others 1996). Seed germination ranges from 20 percent after 15 months in field conditions to 55 percent after 6 months under lab conditions (Hilmon 1968). Seeds can remain viable for up to 1 year, albeit with reduced germination rates (Carrington and others 2000). Seed germination may be enhanced by passing through animal digestive systems (Tanner and others 1996).

**Growth and Management.**—Growth of saw palmetto is slow, ranging between 0.6 and 2.2 cm/year in stem elongation (Abrahamson 1995, Hilmon 1968). Based on these estimates, some saw palmettos may be 500 to 700 years old (Abrahamson 1995, Tanner and others 1996). In some cases, land managers may want to reduce the density and cover of saw palmetto in order to improve cattle forage and/or timber production or to reduce fire hazard. Because saw palmetto is fire-tolerant, mechanical or chemical treatments are often needed for control. Roller-chopping reduces abundance of saw palmetto (Hilmon and others 1963, Lewis 1970) by crushing vegetative parts and removing terminal buds. This treatment is particularly effective during periods of low soil moisture (Moore 1974) or when followed by prescribed burning. Among herbicide treatments, repeated cycles of 2,4,5-T followed by burning will reduce palmetto cover (Altobellis and Hough 1968), but this chemical is no longer available. Metsulfuron, often sold as Escort, is the most effective herbicide currently available for control of saw palmetto (personal communication J.L. Michael, Southern Research Station, Auburn, AL). In other cases, land managers may want to enhance saw palmetto flowering and fruiting. The most cost-efficient practice to increase fruit production is prescribed burning (Carrington and others 2000). Optimal burning frequency is every 5 to 8 years. Soil fertilization has been used to increase coverage of saw palmetto (Carrington and others 2000).

**Fire.**—Saw palmetto naturally occurs in plant communities adapted to periodic burning. Saw palmetto itself is highly flammable due to the accumulation of dead fronds that remain on the plants for several years (Carrington and others 2000) and volatile waxes that cover green leaves. Fires commonly consume all above-ground foliage of saw palmettos, and therefore, prescribed fire is used to reduce leaf coverage for short periods. However, leaf growth usually begins a few days after fires, and saw palmettos can regain 80 percent of crown coverage the first year after burning (Hilmon 1968). Fire also benefits fruit production of saw palmetto, especially within the first year following burns (Carrington and others 2000). However, flowering may be reduced for several years after burns (Abrahamson 1999) as palmettos recover from both burning and heavy fruit production. Frequent burning (every 1 to 4 years) curtails flowering and fruiting by keeping carbohydrate reserves low (Hilmon 1968).

**Detriments and Benefits.**—Saw palmetto was viewed by early settlers in the Southeastern United States as an obstacle to establishing agricultural fields, cattle pastures, and home sites. Ranchers continue to regard it as a competitor of native forage grasses, and foresters cite that it inhibits pine regeneration. Despite these detriments, saw palmetto is viewed as a significant pharmaceutical resource in Florida and southern Georgia due to the effectiveness of certain fruit compounds (such as free fatty acids, phytosterols) in treating benign prostatic hyperplasia (Tasca 1985, Braeckman 1994, Wilt and others 1998), or swelling of the prostate gland. In 1995, saw palmetto fruits collected for pharmaceuticals sold for over $6/kg. Total estimated value of fruits sold in 1996 was approximately $5 million (Carrington and others 2000). In addition to its medicinal value, saw palmetto can be a significant source of honey production (Bennett and Hicklin 1998). Saw palmetto is also a good native plant for enviroscaping due to its natural drought- and insect-resistance, and low requirements for fertilization (Tanner and others 1996). Saw palmettos serve as nesting and denning habitat for over 100 animal species, including: the endangered Florida grasshopper sparrow (*Ammodramus savannarum* Gmein), Florida panther (*Felis concolor* Linnaeus), Florida woodrat (*Neotoma floridana* Ord), wild turkey (*Meleagris gallopavo* Linnaeus), and white-tailed deer (*Odocoileus virginianus* Zimmermann) (Tanner and others 1996). Fruits are eaten by black bears (*Ursus americanus* Pallas), white-tailed deer (*Odocoileus virginianus*), raccoons (*Procyon lotor* Linnaeus), turkeys (*Meleagris gallopavo*), bob-white quail (*Colinus virginianus* L.), gray foxes (*Urocyon cinereoargenteus* Schreber), opossum (*Dasypus novemcinctus* Linnaeus), and gopher tortoises (*Gopherus polyphemus* Daudin) (Maehr and Layne 1996).

**References**


Abrahamson, W.G. 1995. Habitat distribution and competitive neighborhoods of two Florida palmettos. Bulletin of the Torrey Botanical Club 122: 1-14.

Abrahamson, W.G. 1999. Episodic reproduction in two fire-prone palms, *Serenoa repens* and *Sabal etonia* (Palmae). Ecology 80:100-115.

Altobellis, A.T. and W.A. Hough. 1968. Controlling palmetto with fire and herbicides. Georgia Forestry Research Paper 52. Georgia Forest Research Council, Macon, Ga.

Bennett, B.C. and J.R. Hicklin. 1998. Uses of saw palmetto (*Serenoa repens*, Arecaceae) in Florida Economic Botany 52: 381-393.

Braeckman, J. 1994. The extract of *Serenoa repens* in the treatment of benign prostatic hyperplasia: A multicenter open study. Current Therapy Research 55: 776-785.

Carrington, M.E., T.D. Gottfried, and J.J. Mullahey. (In review) Pollination biology of saw palmetto (*Serenoa repens*: Palmae) in southwestern Florida. Palms.

Carrington, M.E., J.J. Mullahey, G. Krewer, B. Boland, and J. Affolter. 2000. Saw palmetto (*Serenoa repens*): an emerging forest resource in the southeastern United States. Southern Journal of Applied Forestry 24(3): 129-134.

Carrington, M.E., J.J. Mullahey, and F. Roka. 1997. Saw palmetto: A fountain of youth. Proceedings American Forage Grassland Council 6: 233-237.

Fisher, J.B. and P.B. Tomlinson. 1973. Branch and inflorescence production in saw palmetto (*Serenoa repens*). Principes 17: 10-19.

Hilmon, J.B. 1968. Autecology of saw palmetto [*Serenoa repens* (Bartr.) Small]. Duke University, Durham, N.C. 191 p. Ph.D. Dissertation.

Hilmon, J.B., C.E. Lewis, and J.E. Bethune. 1963. Highlights of recent results of range research in Southern Florida. Society of American Foresters Proceedings 1962: 73-76.

Lewis C.E. 1970. Responses to chopping and rock phosphate on south Florida ranges. Journal of Range Management 23: 276-282.

Maehr, D.S. and J.N. Layne. 1996. Florida's all-purpose plant the saw palmetto. Palmetto (Fall): 16 –10, 15, 21.

McNab, W.H. and M.B. Edwards. 1980. Climatic factors related to the range of saw-palmetto [*Serenoa repens* (Bartr.) Small]. American Midland Naturalist 103: 205-208.

Moore, W. H. 1974. Some effects of chopping saw-palmetto pineland threeawn range in south Florida. Journal of Range Management 27(2): 101-104.

Small, J.K. 1926. The saw-palmetto–*Serenoa repens*. Journal of the New York Botanical Garden 27: 193-202.

Small, J.K. 1933. Manual of the southeastern flora. John Kunkel Small, New York. 1,554 p.

Tanner, G.W., J.J. Mullahey, and D. Maehr. 1996. Saw-palmetto: an ecologically and economically important native palm. Circular WEC-109, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL. 7 p.

Tasca, A. 1985. Treatment of obstructive symptomatology in prostatic adenoma with an extract of *Serenoa repens*. Minerva Urologica e Nefrologica 37: 87-91.

Wilt, T., A. Ishani, and C. Mulrow. 1998. Saw palmetto extracts for treatment of benign prostatic hyperplasia: a systemtatic review. Journal of the American Medical Association 280: 1,604-1,609.

Deborah K. Kennard, Research Ecologist, U.S. Department of Agriculture, Forest Service, G.W. Andrews Forestry Sciences Laboratory, 520 Devall Drive, Auburn, AL 36830 and Kenneth Outcalt, Research Ecologist, U.S. Department of Agriculture, Forest Service, 320 Green Street, Athens, GA 30602 and Mary Carrington, Assistant Professor, Science Division, Governors State University, 1 University Parkway, University Park, IL 60466.